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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/772,728	01/30/2001	Hiro Yoshi Tanimoto	PM 0245692 081225	2553

7590 02/22/2005

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EXAMINER

HOGAN, MARY C

ART UNIT PAPER NUMBER

2123

DATE MAILED: 02/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	Application No. 09/772,728	Applicant(s) TANIMOTO, HIROYOSHI	
	Examiner Mary C Hogan	Art Unit 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This application has been examined.
2. **Claims 1-24** have been examined and rejected.

Specification

3. The disclosure is objected to because of the following informalities. Appropriate correction is required.
4. Page 2, the start of paragraph 1 states, "In such a background recently...". This statement is unclear in meaning. It is suggested that it be changed to read, "In the field of related art...".
5. Page 2, line 2 contains the following error, "...requires...".

Claim Rejections - 35 USC § 112

6. A substitute specification has been entered in accordance with 37 C.F.R. 1.125 and examined. Examiner withdraws the earlier **35 USC § 112**, first paragraph rejection.
7. Amendments to Claims 1-20 have been examined. Examiner withdraws the earlier **35 USC § 112**, second paragraph rejections.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:
A person shall be entitled to a patent unless –
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
9. **Claims 1-24** are rejected under 35 U.S.C. 102(b) as being anticipated by Hurkx et al (Hurkx et al, "A New Analytical Diode Model Including Tunneling and Avalanche Breakdown", IEEE Transactions on Electron Devices, Vol. 39, No. 9, September 1992), herein referred to as **Hurkx**.
10. As to **Claims 1-24**, **Hurkx** teaches circuit simulation (**page 2090, column 1, last 5 lines**) using a model that integrates a carrier generation and extinction speed obtained in each carrier generation and extinction mechanism (**page 2091, column 2, equation 8**), the carrier generation and extinction mechanism including an SRH process (**page 2091, column 1, equation 4 and description**), impact

ionization (page 2091, column 1, equation 3 and description), inter-band tunneling (page 2091, column 1, second bullet, and column 2, equation 10), extracting the plurality of the generation and extinction speeds by numerically solving the physical equations (page 2091, column 1, sentence 3-column 2, equation 7). Further, Hurkx teaches extracting and outputting electrical characteristics repeatedly by varying a bias condition to the semiconductor device (Figures 6 and 7, Table 1 and descriptions).

Response to Arguments

11. Applicant's arguments filed on 12/10/04 regarding claims 1-24 have been considered but they are not persuasive.

12. Applicant argues as to claim 1: "the Hurkx reference does not show that "an integral value calculator configured to integrate a carrier generation and extinction speed obtained in each carrier generation and extinction mechanism by numerically solving the physical equations, in the each carrier generation and extinction mechanism within a semiconductor region, and issue the result obtained by integration respectively." (page 11, paragraph 3). Applicant further argues that these limitations "in each carrier generation and extinction mechanism" and "obtained by integration respectively" in claims 6, 11 and 16 are not taught as discussed for claim 1 (page 11 last paragraph-page 12, first paragraph).

13. As to the above argument, Hurkx shows an integral value calculator configured to integrate a carrier generation and extinction speed (Equation 8) obtained in each carrier generation and extinction mechanism by numerically solving the physical equations (equations 3-7), in the each carrier generation and extinction mechanism within a semiconductor region (Figure 2), and issue the result obtained by integration respectively (page 2090, column 1, last sentence, column 2, sentences 3-6, Table 1).

14. Equation 8 shows an integral value calculator since it integrates the carrier generation and extinction speeds where the carrier generation and extinction speeds are represented in the determinations for R_{trap} , R_{bbt} and the ionization coefficient obtained by numerically solving physical equations. Equation 8 is used in the development of a model used to obtain electrical characteristics of a semiconductor device whereby the results are issues as shown in Table 1. Figure 3 and equation 8 show that the integration is performed over various regions, and therefore, evaluated at each carrier generation and extinction mechanism within the semiconductor region.

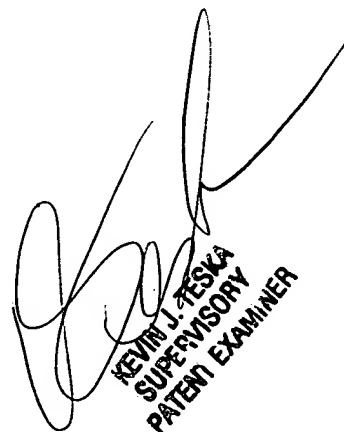
Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary C Hogan whose telephone number is 571-272-3712. The examiner can normally be reached on 7:30AM-5PM Monday-Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on 571-272-3716. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mary C Hogan
Examiner
Art Unit 2123



KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER